CLAIMS

What is claimed is:

1. An optical fiber, comprising:

a core,

a cladding layer,

a coupling coating abutting the cladding layer at a cladding-coating interface, the coupling coating having a refractive index higher than the cladding layer and the cladding-coating interface is positioned at radius of less than 55 microns from a centerline of the optical fiber such that higher order mode attenuation is enhanced as compared to fundamental mode attenuation, and

a measured cutoff wavelength (λc) of the optical fiber is greater than 1500 nm.

2. The optical fiber of claim 1 the cladding-coating interface is positioned at less than 50 microns from the centerline of the optical fiber.

3. The optical fiber of claim 1 the cladding-coating interface is positioned at less than 45 microns from the centerline of the optical fiber.

4. The optical fiber of claim 1 wherein the cladding-coating interface is positioned at greater than 30 and less than 50 microns from the centerline of the optical fiber.

5. The optical fiber of claim 1 wherein the cladding-coating interface is positioned at greater than 35 and less than 50 microns from the centerline of the optical fiber.

6. The optical fiber of claim 1 wherein the cladding-coating interface is positioned at greater than 40 and less than 50 microns from the centerline of the optical fiber.

7. The optical fiber of claim 1 wherein the core has a refractive index profile having

a central core segment having a positive delta ($\Delta 1$), and

a moat segment surrounding the central core segment having a negative delta ($\Delta 2$).

8. The optical fiber of claim 7 wherein the core further includes a ring segment surrounding the moat segment having a positive delta ($\Delta 3$).

9. The optical fiber of claim 1 wherein an outermost radius of the fiber is less than or equal to 100 microns.

10. The optical fiber of claim 9 wherein the outermost radius is less than or equal to 90 microns.

11. The optical fiber of claim 1 wherein the coupling coating is a polymer.

12. The optical fiber of claim 11 wherein the coupling coating is a primary coating layer.

13. The fiber of claim 11 wherein the coupling coating comprises a urethane acrylate.

14. The optical fiber of claim 1 wherein the coupling coating includes a metal.

15. The optical fiber of claim 1 wherein the coupling coating includes carbon.

16. The optical fiber of claim 1 wherein the coupling coating exhibits a delta ($\Delta 4$) of greater than 1%.

17. The optical fiber of claim 1 wherein a loss in the fiber propagating in a higher order mode is greater than 10 dB/km when wound onto a spool having a winding diameter of less than 254 mm.

18. The optical fiber of claim 1 wherein a fundamental mode loss in the fiber in a LP_{01} mode is less than 0.5 dB/km when wound onto a spool having a winding diameter of less than 254 mm.

19. The optical fiber of claim 18 wherein the fundamental mode loss in the fiber in a LP_{01} mode is less than 0.1 dB/km.

20. The optical fiber of claim 1 wherein the fiber is a dispersion compensating fiber.

21. The optical fiber of claim 1 wherein the dispersion compensating fiber has a total dispersion at 1550 nm more negative than –20 ps/nm-km.

22. A dispersion compensating optical fiber, comprising:

a core having at least a central core segment having a positive delta ($\Delta 1$) and a moat segment surrounding the central core segment having a negative delta ($\Delta 2$),

a silica-containing cladding layer surrounding the core,

a coupling coating abutting the cladding layer at a cladding-coating interface, the coupling coating having a refractive index higher than the silica-containing cladding layer and the cladding-coating interface is positioned such that a higher order mode attenuation loss of at least one mode selected from the group of the LP_{11} and LP_{02} modes at 1550 nm is at least 10 dB/km.

23. The dispersion compensating optical fiber of claim 22 wherein a measured cutoff wavelength (λc) of the fiber is greater than 1500 nm.

24. The dispersion compensating optical fiber of claim 22 wherein the coupling coating is a polymer.

25. A dispersion compensating module, comprising:

a winding spool,

a dispersion compensating fiber wound onto the winding spool, the dispersion compensating fiber including

a core,

a cladding layer surrounding the core,

a coupling coating having a refractive index higher than the cladding layer, and

a cladding-coating interface at a point of interface between the cladding layer and the coupling coating, the cladding-coating interface being positioned at a radius of between 35 and 50 microns from a centerline of the dispersion compensating fiber.

26. The dispersion compensating module of claim 25 wherein said dispersion compensating fiber has a measured cutoff wavelength (λc) greater than 1500 nm.

27. The dispersion compensating module of claim 25 wherein the coupling coating is a polymer.

28. The dispersion compensating module of claim 25 wherein the cladding-coating interface is positioned such that a higher order mode attenuation loss in the module of at least one mode selected from the group of the LP_{11} and LP_{02} modes at 1550 nm is at least 10 dB/km.

29. The dispersion compensating module of claim 25 wherein a fundamental mode loss in the dispersion compensating fiber in a LP_{01} mode is less than 0.5 dB/km when wound onto a spool having a winding diameter of less than 254 mm.

30. The dispersion compensating module of claim 29 wherein the fundamental mode loss in the dispersion compensating fiber in a LP_{01} mode is less than 0.1 dB/km.

31. The dispersion compensating module of claim 25 wherein an outermost radius of the dispersion compensating fiber is less than or equal to 100 microns.

32. The dispersion compensating module of claim 31 wherein the outermost radius is less than or equal to 90 microns.

33. An optical transmission system, comprising:

a transmitter,

a length of optical transmission fiber optically coupled to the receiver, said length being greater than 10 km,

a dispersion compensating fiber optically coupled to the transmission fiber, said dispersion compensating fiber including

a core,

a cladding layer,

a coupling coating abutting the cladding layer at a cladding-coating interface, the coupling coating having a refractive index higher than the cladding layer wherein the cladding-coating interface is positioned at radius of less than 55 microns from a centerline of the optical fiber such that higher order mode attenuation is enhanced as compared to fundamental mode attenuation, and

a receiver optically coupled to the dispersion compensating fiber.

34. The dispersion compensating optical fiber of claim 33 wherein a measured cutoff wavelength (λc) of the optical fiber is greater than 1500 nm.

35. The optical transmission system of claim 33 wherein the cladding-coating interface is positioned at radius of greater than 30 microns but less than 50 microns from a centerline of the optical fiber.

36. The optical transmission system of claim 33 wherein the cladding-coating interface is positioned at radius of less than 45 microns from a centerline of the optical fiber.

37. The optical transmission system of claim 33 wherein the cladding-coating interface is positioned at greater than 40 microns but less than 50 microns from a centerline of the optical fiber.

38. The optical transmission system of claim 33 wherein an outermost radius of the optical fiber is less than or equal to 100 microns.

39. The optical transmission system of claim 38 wherein an outermost radius is less than or equal to 90 microns.

40. The optical transmission system of claim 33 wherein the dispersion compensating optical fiber is housed in a module.

41. The optical transmission system of claim 33 wherein the dispersion compensating optical fiber has a total dispersion at 1550 nm more negative than –20 ps/nm-km.

42. The optical transmission system of claim 33 wherein the coupling coating is selected from the group consisting of a polymer, a metal, and carbon.